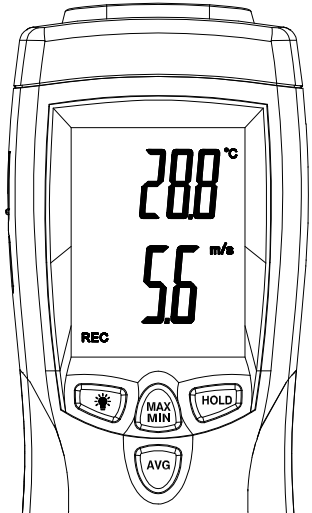
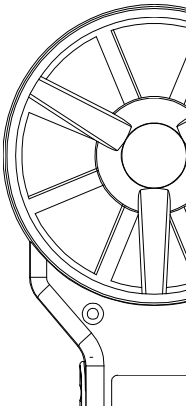
User's Manual

CFM/CMM Thermo Anemometer 94204



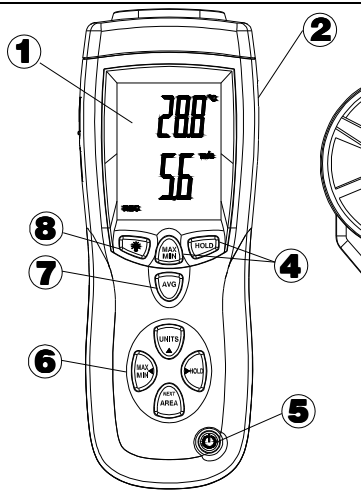


Introduction

The CFM/CMM Thermo Anemometer instrument measures Air Velocity, A
(volume) and Temperature. The large, easy-to-read backlit LCD includes p
secondary displays plus numerous status indicators. The meter is shipped
and calibrated and with proper use will provide years of reliable service.

Meter Description

1. LCD Display
2. Meter
3. Vane
4. Temperature Buttons
5. Power On/Off
6. Airflow/Velocity Buttons
7. AVG
8. Backlight



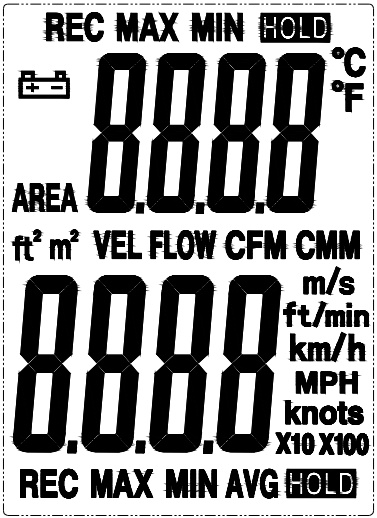
Keypad

- **POWER** Press to turn the meter ON or OFF
- **MAX/MIN** Used to record and store the highest, lowest and averag
  velocity readings.

  ◄ (LEFT) also serves as change decimal point button in AREA mo
- **UNITS** Press to select the mode of operation. In FLOW mode, the
  air *volume*. In VELOCITY mode, the meter displays air *speed*.

  ▲(UP) also serves as increase number button in AREA mode.

Display Layout



- **MAX** (top of LCD): Max Hold function engaged for the Air Tempera
- **HOLD** (top of LCD): Data Hold function engaged for the Air Tempe
- **VEL**: indicates that meter is in air velocity mode
- **FLOW**: indicates that meter is in air flow mode
- **MAX** (bottom of LCD): Max Hold for the Air Velocity and Air Flow f
- **HOLD** (bottom of LCD): Data Hold for the Air Velocity and Air Flow
- **°C / °F**: Temperature units of measure
- **CFM/CMM**: airflow units of measure
- **AREA(ft^2, m^2)**: units for area dimensions
- **m/s, ft/min, km/h, MPH, knots:** air velocity units of measure

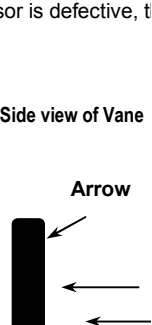
Operation

Connecting the Vane

1. The vane plug is inserted in the meter's sensor jack at the top of the m and jack are keyed so that the plug can only fit in the jack one way.
2. Turn the plug carefully until it lines up with the jack and then firmly pus place. Do not apply undue force or try to twist the plug side-to-side.
3. If the vane is not connected to the meter or if the sensor is defective, t will indicate **OL** in place of a Temperature reading.

Air Velocity Measurements (Single Point)

1. Turn on the meter using the ON/OFF ⏻ button.
2. Press **UNITS** button to select the desired unit of measure. **NOTE:** At power up the meter will display the last unit of measure previously entered.
3. Place the sensor in the air stream. Ensure that the air enters the vane as indicated by the arrow sticker placed inside the vane.
4. View the readings on the LCD Display. The large main LCD display shows the Air Velocity reading. The upper right LCD sub-display shows the temperature reading.



Air Velocity Averaging Mode

1. To enter 20 Point Averaging Mode, press and hold the **AVG** button un The **AVG** icon will be displayed.
2. Take a measurement and press the **AVG** button. A single beep will so **HOLD** icon will appear in the display.
3. The average reading will be displayed and number of readings measu the upper right hand corner of the display. After 5 seconds, the display current reading.

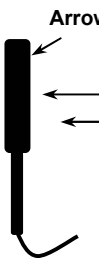
Air Flow Measurements (CMM / CFM)

1. Turn on the meter using the ⏻ ON/OFF button
2. Press the **UNITS** button to select the desired air flow units: CMM (cubic meters per minute) or CFM (cubic feet per minute). **NOTE:** At power up the meter will display the last unit of measure previously entered.
3. To begin entering the area in m^2 or ft^2, press and hold the **AREA** button until it beeps twice. The leftmost digit of the bottom display will begin to flash.
4. Use the ▲ (UP) button to change the flashing digit

   Use the ◄ (LEFT) button to move the decimal

   Use ► (RIGHT) button to select the other digits.

   After all of the digits are entered, press and hold the **AREA** button (until meter beeps twice) to save the area into memory CFM or CMM measuring mode.
5. Place the sensor in the air stream. Ensure that the air enters the van the arrow sticker placed inside the vane. Refer to the diagram. The la display shows the Air Velocity reading. The upper right LCD sub-disp temperature reading.



The meter has 16 memory locations (8 for CFM and 8 for CMM) that can be commonly used area sizes that you can recall at anytime.

1. Press the **AREA** button until meter beeps twice. A memory location n appear in the top right of the display indicating the memory location.
2. Push the **NEXT** button to scroll thru and select the desired location. O selected the desired memory location enter your dimension

   Use the ▲ (UP) button to change the flashing digit

   Use the ◄ (LEFT) button to move the decimal

   Use ► (RIGHT) button to select the other digits. After all of the digits press and hold the **AREA** button (until it beeps twice) to save the are and return to CFM or CMM measuring mode.

To select and use a previously stored dimension, press and hold the **AREA** b

Data Hold (Air Velocity/Air Flow)

1. While taking measurements, press the **HOLD** button to freeze the air v reading.
2. The **HOLD** indicator will appear in the bottom of the LCD display.
3. Press **HOLD** again to return to normal operation.

MAX/MIN/AVG Record (Air Velocity/Air Flow)

This allows the user to record and view the highest (MAX), lowest (MIN) a (AVG) readings.

1. Press the button **MAX/MIN** button. The **MAX** indicator and **RECORD** i with the Max reading will appear on the LCD display and the meter wil track of the MAX, MIN and Average values.
2. Press the **MAX/MIN** button again to view the minimum reading. The **M** along with the minimum reading will appear on the LCD display.
3. Press the **MAX/MIN** button again to view the average reading. The AV along with the average reading will appear on the LCD display.

   NOTE: Average recording will stop automatically after 2 hours, and th sub-display will show a OFF (only in the average mode).
4. Press the **MAX/MIN** button again to display current readings. **NOTE:** t keep recording MAX/MIN/AVG readings.
5. To clear and stop MAX/MIN/AVG recording and return to normal opera hold the **MAX/MIN** button until the meter beeps twice.

Automatic Power OFF

To conserve battery life, the meter automatically turns off after 20 minutes feature:

1. Turn the meter OFF.
2. Press and hold the ☼ (Backlight) key while turning the meter ON.
3. “dis APO” will appear in the display. The AUTO POWER OFF feature disabled.
4. Note that AUTO POWER OFF is re-enabled each time the meter is tu
5. Also note that AUTO POWER OFF is disabled in CFM/CMM or Averag

Specifications

Air Velocity	**Range**	**Resolution**	
m/s (meters per sec)	0.40 - 30.00 m/s	0.01 m/s	± (
km/h (kilometers/hour)	1.4 - 108.0 km/h	0.1 km/h	± (
ft/min (feet per minute)	80 – 5900 ft/min	1 ft/min	±
mph (miles per hour)	0.9 – 67.0 mph	0.1 mph	± (
knots (nautical MPH)	0.8 to 58.0 knots	0.1 knots	± (
Air Flow	**Range**	**Resolution**	
CMM (cubic meters/min)	0-999900 m^3/min	0.001 to 100	0 .
CFM (cubic ft/min)	0-999900 ft^3/min	0.001 to 100	0.
Air Temperature	**Range**	**Resolution**	
	14 - 140°F (-10 - 60°C)	0.1°F/C	

Circuit	Custom LSI microprocessor circuit
Display	Dual function 0.7" (16 mm) 4-digit LCD
Sampling rate	1 reading per second approx.
Sensors	Air velocity/flow sensor: Conventional angled v low-friction ball bearing Temperature sensor: NTC-type precision therr
Automatic Power off	Auto shut off after 20 minutes to preserve batt
Operating Temperature	32 to 122°F (0 to 50°C)
Storage Temperature	14 to 140°F (-10 to 60°C)
Operating Humidity	<80% RH
Storage Humidity	<80% RH
Operating Altitude	2000 meters (7000ft) maximum
Battery	One 9 volt (NEDA 1604) battery
Battery life	80 hours approx. (if the Backlight is used cont life will be reduced significantly)
Battery Current	8.3 mA DC approx.

Useful Equations and Conversions

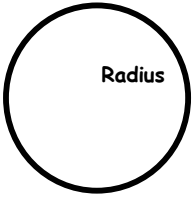
Area equation for rectangular or square ducts

Height (H)

Width (W)

Area (A) = Width (W) x Height (H)

Area equation for circular ducts



Area (A) = ⑥ x r^2
Where ⑥ = 3.14 and r^2 = radius x

Cubic equations

CFM (ft^3/min) = Air Velocity (ft/min) x Area (ft^2)
CMM (m^3/min) = Air Velocity (m/sec) x Area (m^2) x 60